HabEx

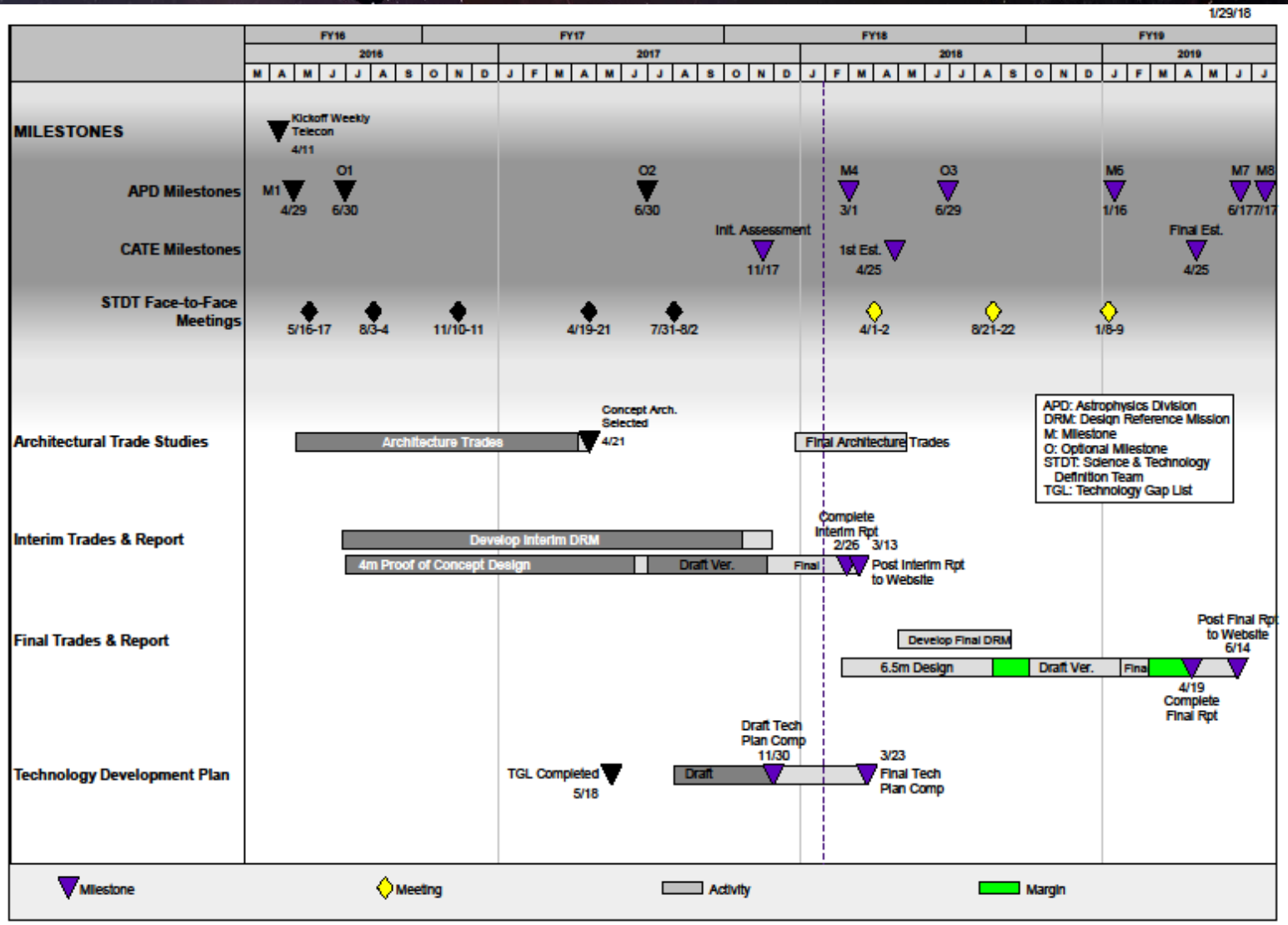
Final Report Considerations including Timeline to Final Report and Summary of Design Updates to Architecture A

Keith Warfield

Jet Propulsion Laboratory, California Institute of Technology

May 3, 2018

- News and Highlights
  - Met M3 delivery – Delivered ITAR restricted version of Interim Report on 3/30
    - Need to deliver public version by the end of June
  - O3 delivery has been dropped by DSMT. Delivery was too soon after the Interim Reports which gave technology input.
  - Aerospace cannot perform mock CATEs on the report concepts due to firewall issues. DSMT is looking at alternative vendors for ICE estimates
- Final Report Milestones
  - Need ICE inputs by January 2019 (M6)
  - Get ICE estimate by April 2019
  - Final Report is due June 2019 (M7)



Predecisional information for planning and discussion only

Option A Updates for Final Report

- **Science**
  - Determine how to deal with binaries
  - Establish requirements for methane detection and abundance measurements
  - Establish requirements for CO_2 detection and abundance measurements
  - Establish requirements for H_2O, O_2, O_3 detection and abundance measurements
  - Update occurrence rates, especially for cold planets
  - Refine / check target list
  - Determine feasibility of polarimetric observations of exoplanets
  - Assess the potential for precursor and contemporaneous observations to enhance the HabEx observations
  - AGN science with coronagraph or starshade?
  - Determine if GO fraction can be increased above 25% based on analysis of time required for exoplanet measurements

Option A Updates for Final Report (Cont'd)

- **Engineering Trades & Design Update**
  - Finish telescope flight system mechanical and thermal modeling
  - Make final coronagraph choice based on STOP modeling
  - Update coronagraph design. Remove NIR coronagraph?
  - Resize the starshade
  - Redesign the reduced starshade
  - Update the error budgets
  - Improve instrument packaging and CAD
  - Develop Telescope monoprop propellant estimate based on DRM
  - Update coronagraph design for final architecture
  - Update spacecraft design with final instruments
  - Reduce telescope spacecraft mass
  - Separate launch configurations
  - Update pointing estimates with final design
  - Develop servicing story
  - Develop integration and test story
  - Generate margin tables

HabEx

Option B Work for Final Report

- Develop a new DRM
- Update the STM
- Cost and schedule estimates for both options
- Possible additional work depending on Option B Choice
  - Develop new error budgets
  - Telescope design work
  - Instrument repackaging
  - Telescope flight system design
  - Redesign point control if needed
  - Update technology development story